SOME FOSSIL SPECIES OF *BABYLONIA* SEEN IN ULTRAVIOLET LIGHT, WITH DESCRIPTION OF A NEW SPECIES (MOLLUSCA, GASTROPODA)

by

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With three plates

When preparing a revision of the genus *Babylonia* for "Indo-Pacific Mollusca", edited by Dr. R. Tucker Abbott, we tried ultraviolet light to see the outline of the colour-pattern of some fossil species.

Later on we saw the same method described by Mrs. Katherine Krueger (1971).

Dr. H. E. Coomans of the Institute for Taxonomic Zoology (Zoological Museum), Amsterdam, called our attention to this method. We used an ultraviolet lamp UVSL-15 of Ultra-Violet Products Inc., San Gabriel, California. Mr. Chr. Hoorn, photographer of our museum, found a method to photograph the normally invisible pattern. He used an orthochromatic film, Copex Ortho, Agfa-Gevaert, 12° din, in combination with a yellow filter. After having found a suitable specimen by previous examination with the lamp in a dark room, that shell was exposed to short and long wave ultraviolet together from four sides, each time during five minutes. As this resulted in some good photographs, these will be published here.

We first show a recent and a fossil specimen of *Babylonia spirata* (L.) (pl. 1 figs. 1, 2). The recent one is from the Bay of Djakarta; the other is from the Young Neogene at Benkulen, Sumatra. There is general conformity in the colour-pattern of these two specimens, but also some differences are apparent. The spots along the sutural canal are relatively large in the fossil specimen and the other spots are conspicuously rounded and rather constant in size. The recent *B. spirata*, however, shows a great variability in the colour-pattern. The figured shell is the one in our collection which comes nearest to the fossil specimen.

In *Babylonia pangkaensis* (Martin) [1]) (pl. 1 figs. 3, 4) the colour-pattern is quite different from that in *B. spirata*. It varies too; in the lectotype

1) We have chosen the specimen figured by Martin (1895, Samml. geol. Reichsmus. Leiden, n. ser., 1 (2-5), pl. 16 figs. 228, 228a) as lectotype.

(fig. 3) no big spots are visible along the sutural canal, but many small spots are present on the whole surface of the shell. In the other specimen figured the big spots along the sutural canal are present, followed by about six concentric lines, which are sometimes interrupted, situated above the periphery, and small spots below.

The colour-pattern of *Babylonia leonis* spec. nov. will be mentioned in the description.

Chapman (1918) in his "Report on a collection of Cainozoic fossils from the oil-fields of Papua" mentions "*Eburna borneensis*, Sow" from the Wade collection. Because its locality is far outside the recent area of distribution of all species of *Babylonia*, including *Babylonia* (= *Eburna*) *borneensis* (Sowerby), we were anxious to see the specimens.

As Mr. Frederick Chapman was palaeontologist of the National Museum of Victoria, Melbourne, we wrote to the Director of that Museum. Mr. Thomas A. Darragh, curator of fossils, answered that the Wade collection at present is housed in the Commonwealth Palaeontological Collection in the Bureau of Mineral Resources, Geology and Geophysics at Canberra. From this Bureau we got on loan their specimens of *Babylonia*, identified as "*Eburna canaliculata*", of which two were from Cape Possession and were probably from the Wade collection, as they are closely related to *Babylonia borneensis*. If this is true, Chapman's original identification must have been changed in *E. canaliculata* later on. The specimens appeared to represent a new species which was also found to be present in material from the north coast of New Guinea. There was, moreover, also a specimen of another species from the north coast of New Guinea, which may belong to *Babylonia ambulacrum* (Sowerby) because of the form of the sutural canal. As this specimen is damaged, and the remaining specific characters can not be distinctly seen, our identification has to remain uncertain.

Babylonia leonis spec. nov. (pl. 2 figs. 5-6, pl. 3 figs. 7-8)

?1918 *Eburna borneensis*, Sow. — Chapman, Bull. Terr. Papua, 5: 10 (Pliocene, shell beds of Cape Possession).

Diagnosis. — A species of *Babylonia* related to *B. borneensis* (Sowerby) because of a knobbed band around the umbilicus, but having a narrower sutural canal throughout the whole length than even *B. ambulacrum*.

Holotype (pl. 2 figs. 5-6, pl. 3 fig. 7). — Pliocene, Cape Possession, Papua (No. 12119, Bureau of Mineral Resources, Geology and Geophysics, Canberra, Australia).

Paratypes. — One specimen, same locality as holotype (No. 12120). Five

specimens, Pliocene, Yeri Yeri Creek, Maimai Dome or Maimai anticline, southern flank of the Toricelli Mountains, N. of the Sepik River, 3°44′ S, 142°23′ E (nos. 12121-12125). One specimen, Pliocene (Finsch Coast Series), Ninab Creek, above Iwanibuan Creek, Sepik District, New Guinea (No. 12126). Two specimens, Pliocene (Finsch Coast Series), Wahu Creek, between Animbe and Bombonemi, Sepik District, New Guinea (Nos. 12127-12128). All in the collection of the Bureau of Mineral Resources, Geology and Geophysics, Canberra, Australia.

Description. — Shell up to 40 mm high and 28 mm broad; somewhat more than 8 whorls; aperture more than half the height of the shell. Whorls with a deep and very narrow sutural canal, widening just at the aperture; the canal has an erect margin, passing into the evenly rounded whorls; the last whorl, above the periphery and near the aperture, becomes somewhat flattened. Aperture oval; with at the upper corner a groove for the anus, corresponding with the raised margin of the suture, and basally a deep notch for the sipho. The anal notch is also visible when the erect margin is seen from above. Outer lip thickened above; inner lip with a tooth at the end of a rib forming the left underside of the anal groove and with thick callus on the last whorl, extending to the lower end of the left lip and showing a deep notch for the umbilicus.

Umbilicus fairly wide, at the upper and left side surrounded by a fasciole divided into two parts, terminating in the notch for the sipho. The first part has a ridge along the last whorl, which ends at the bottom of the right lip; the second part is narrower and rounded, terminating in front of the notch which forms the underside of the left lip. At the inside of the fasciole there is a distinctly knobbed band, running to the lower end of the left lip. The smooth surface of the shell shows only growth lines; very fine spiral-lines are to be seen with a lens.

In only one specimen, from the Pliocene of the Sepik District, New Guinea (No. 12127), remnants of the colour-pattern could be made visible with the ultraviolet lamp (pl. 3 fig. 8), but not so well as in our specimens of fossil *B. spirata* and *B. pangkaensis*. We could discern two bands of large spots in the middle of the last whorl, the spots of these bands are situated obliquely under each other. The band of smaller spots at the sutural canal is best seen on the left side. Three equally smaller spots of the lowest band are to be seen and are also vertically connected. We think *B. leonis* had a colour-pattern very much like that of *B. perforata* (Sowerby) (pl. 3 fig. 9). In the figured specimen of *B. perforata* the spots of the two main bands are situated straight under each other. But the holotype figured by Sowerby (1870, pl. 21 fig. 2) and a specimen in the collection of T.C. Lan, Taipei,

Taiwan, have the spots obliquely under each other. Consequently we are dealing with a variable character at least in *B. perforata.*

The operculum is unknown.

Measurements. — Holotype: 40 mm high and 28 mm wide, with somewhat more than 8 whorls. Paratype (no. 12128): 33 mm high and 22 mm wide, with 7½ whorls.

This new species is named in honour of Prof. Dr. Leo D. Brongersma, who contributed in many ways to our knowledge of the fauna of New Guinea.

Mr. G. C. Young of the Bureau of Mineral Resources, Geology and Geophysics writes us:

"A recent review of the geology of this area is given by Marchant (1969) in Bureau of Mineral Resources Report No. 130 — "A Photogeological Assessment of the Petroleum Geology of the Northern New Guinea Basin, North of the Sepik River, Territory of New Guinea". He places both the Maimai dome strata and the "Finsch Coast Series" in the lower part of a Plio-Pleistocene subdivision".

Because Mr. Marchant places both the Maimai dome strata and the Finsch Coast Series in the lower part of a Plio-Pleistocene subdivision, we have mentioned all the specimens as coming from the Pliocene.

We are much indebted to the Bureau of Mineral Resources, Geology and Geophysics, Canberra, Australia; the Delaware Museum of Natural History, Greenville, U.S.A.; the Mineralogical-Geological Institute, Utrecht and the National Museum of Geology and Mineralogy, Leiden, for having enabled us to study their material. To Dr. Coomans our thanks are due for the loan of the ultraviolet lamp.

LITERATURE

CHAPMAN, FR., 1918. Report on a collection of Cainozoic fossils from the oil-fields of Papua. — Bull. Terr. Papua, 5: 1-17, 2 maps and 2 plates in text (with a geological introduction by A. Wade, p. 3-7).

KRUEGER, K., 1971. Hidden color pattern in fossil shells. — Bull. Field Mus. Nat. Hist., 42 (4): 10-11, 2 figs.

SOWERBY, G. B., 1870. Descriptions of forty-eight new species of shells. — Proc. zool. Soc. London, 1870: 249-254, pls. 21-22.

Plate 1

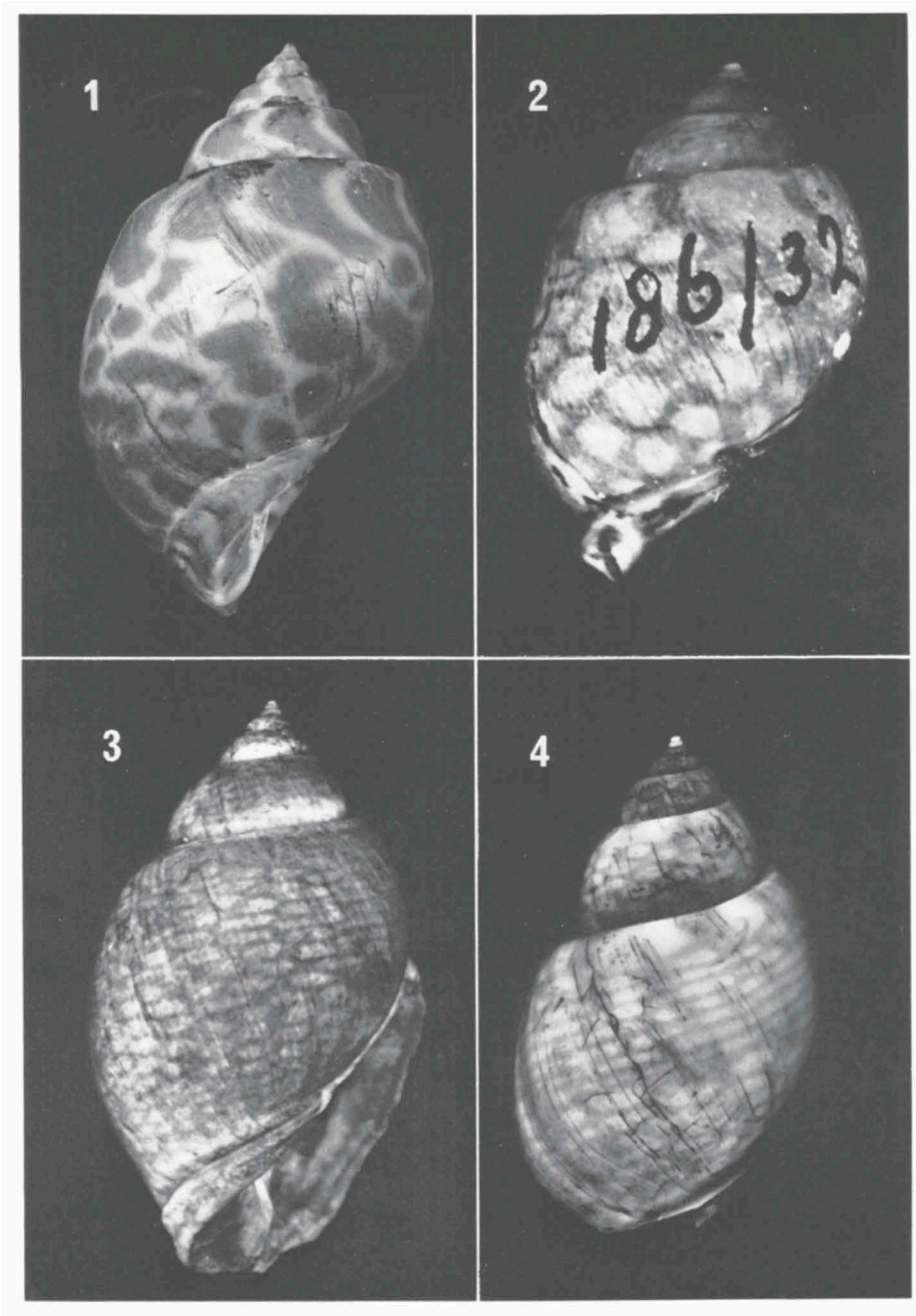
1-2. *Babylonia spirata* (L.). 1, Recent: E. of the canal to Pasar Ikan, Bay of Djakarta, 0.5 to 1.5 m depth, x-xi.1947, R. IJzerman leg., height: 46 mm; Rijksmuseum van Natuurlijke Historie, Leiden; 2, Young Neogene: Lubuq Gunung, Benkulen, Sumatra, 1932, height 28.5 mm; Mineralogisch-Geologisch Instituut, Utrecht. 3-4. *Babylonia pangkaensis* (Martin). 3, lectotype, Pliocene: Meneteng Ravine, Java, height 39 mm; Rijksmuseum van Geologie en Mineralogie, Leiden; 4, Menenteng Ravine, Java, height 38 mm; Rijksmuseum van Geologie en Mineralogie, Leiden. Photographs by Chr. Hoorn.

Plate 2

5-6. *Babylonia leonis* spec. nov., holotype, Pliocene: Cape Possession, Papua, height 39 mm; Bureau of Mineral Resources, Geology and Geophysics, Canberra, Australia. 5, habitus; 6, mouth and umbilicus. Photographs by Chr. Hoorn.

Plate 3

7-8. *Babylonia leonis* spec. nov., holotype. 7, topwhorls; 8, ultraviolet photograph of paratype, Pliocene (Finsch coast series): between Animbe and Bombonemi, Sepik District, New Guinea, height 34 mm; Bureau of Mineral Resources, Geology and Geophysics, Canberra, Australia. 9. *Babylonia perforata* (Sowerby), Recent: dredged at 30 fathoms depth a few miles S. of Koa-hsiung, Taiwan, height 72 mm; Delaware Museum of Natural History. Photographs by Chr. Hoorn.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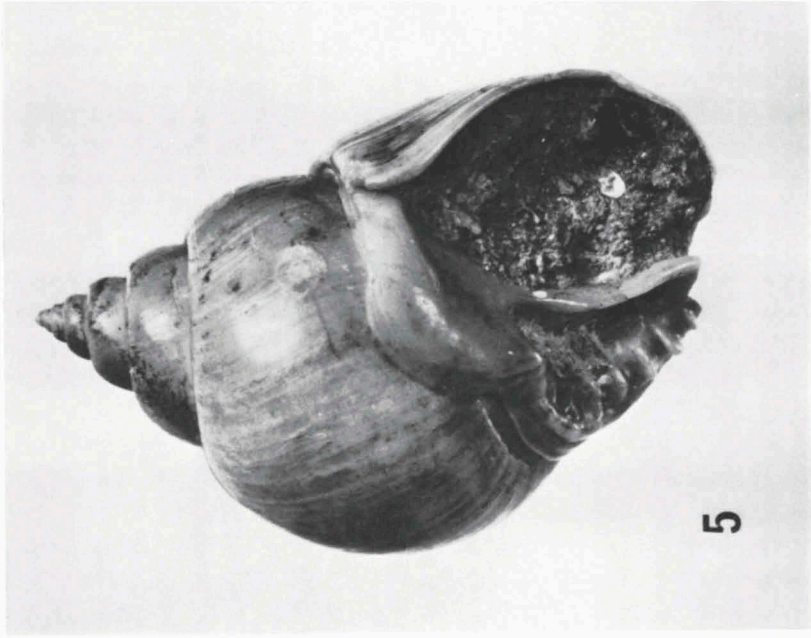

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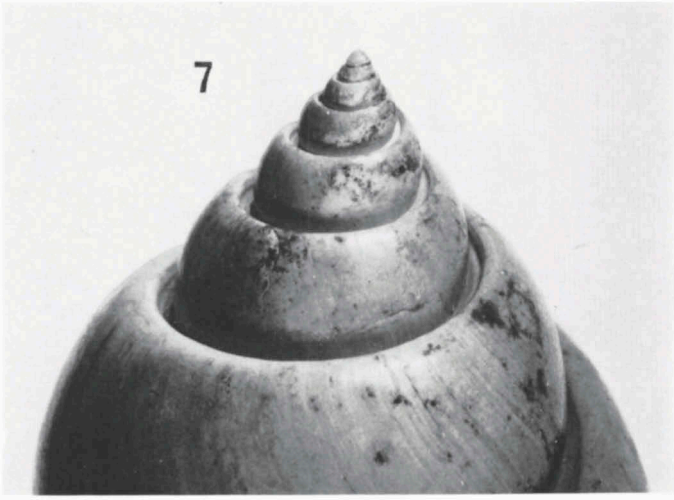
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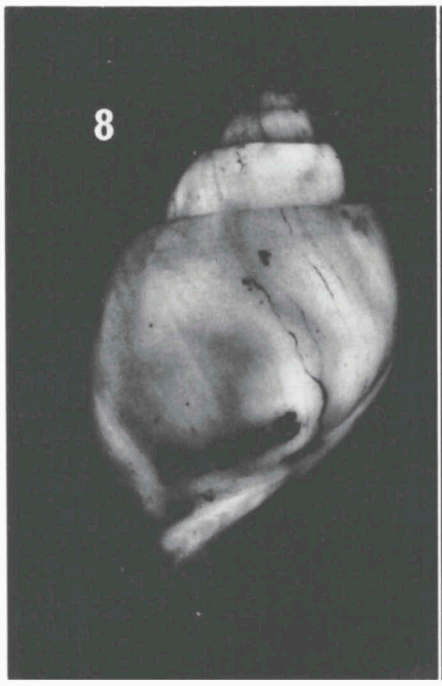
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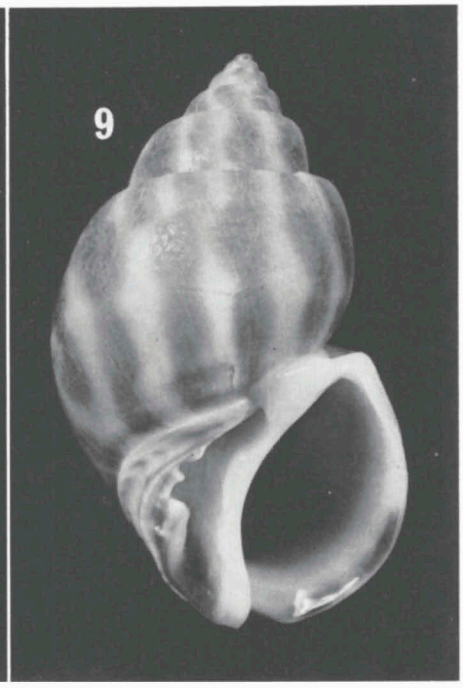
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